

WHAT IS CLAIMED IS:

1. A method for operating a network that includes wireless data transmission between a plurality of users, the network having at least two radio cells which at least partly overlap and in which different channels are used for data transmission, and each radio cell having at least one base station, the method comprising:

interconnecting the base stations of the at least two radio cells, respectively, via at least one common communication channel;

at predefined maximum time intervals and via the base stations, simultaneously processing test cycles of a given maximum duration, wherein test signals are transmitted from the base stations in the respective radio cells during the test cycles; and

determining, within each respective radio-coupled user and based on the test signals, the communication channel with optimum transmission properties for that radio-coupled user.

2. A method as claimed in claim 1, wherein at least one user initiates the test cycles with messages recurring at the predefined maximum time intervals.

3. A method as claimed in claim 2, wherein a user having a logic mastership in a network using an access procedure based on the master-slave principle is the user which initiates the test cycles.

4. A method as claimed in claim 1, further comprising:
sending, from each of the base stations, at least one test signal during a test cycle on the communication channel assigned to the respective base station;

setting, within each of the radio-coupled users, all the communication channels for reception of the test signals during the test cycle; and

retaining, within each respective radio-coupled user, a communication channel with the best transmission properties for the transmission of data after the test cycle.

5. A method as claimed in claim 1, wherein the base stations each successively transmit the test signals on the different communication channels during a test cycle, and no two base stations simultaneously transmit on the same communication channel.

6. A method as claimed in claim 5, further comprising:
receiving, within the radio-coupled users, the test signals during the test cycle on a communication channel that is fixed for the duration of the test cycle; and

determining which base station corresponds to the test signal on the communication channel received with the best transmission properties;

retaining, within each respective radio-coupled user, the respective communication channel of the determined base station as the one with the best transmission properties for the transmission of data after the test cycle.

7. A user device operable to communicate with various base stations within a communication network, wherein the user device is configured to determine a communication channel with the best transmission properties based on test signals transmitted by each of the base stations during test cycles and wherein further, the base stations process received data simultaneously at predefined maximum time intervals having a given maximum duration.

8. A communication system comprising:
a communication link operable to carry communication signals;
a plurality of base stations each corresponding to a respective cell and each connected to said communication link, each base station being operable to transmit test signals in each of a plurality of different channels;

a plurality of user devices each operable to receive the test signals in each channel from each base station, said user devices each comprising a channel determiner operable to determine a channel corresponding to a test signal with the strongest signal level and a switch device operable to switch an interface of the user device to the determined channel.

9. A communication system as claimed in claim 8, wherein the communication link is a PROFIBUS communication link.

10. A mobile user device for use in a wireless network made up of a plurality of area cells, the device comprising:

a receiver operable to receive a plurality of test signals transmitted simultaneously from each of a plurality of base stations, the base stations corresponding, respectively, to each area cell, wherein each test signal comprises a plurality of test messages each of which corresponds to a respective communication channel within the network.

11. A mobile user device as claimed in claim 10, wherein no two test messages corresponding to the same communication channel are transmitted at the same time.

12. A mobile user device as claimed in claim 11, further comprising a channel discriminator operable to select a particular channel corresponding to a communication channel with an optimal signal level.

13. A mobile user device as claimed in claim 10, wherein all of the test messages are transmitted during a test cycle having a fixed predetermined duration and wherein the test cycle is initiated by an initiation message generated by a master device connected to each base station through a communication link.

14. A mobile user device as claimed in claim 12, wherein communication between the user device and at least two base stations is switched from one of the base stations to another of the base stations based on the channel selection made by the user device.